

South Dakota  
Department of  
Transportation

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# Roadway Safety Audit

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NH 0081(23)0, Yankton County, PCEMS 5610

Final Report  
January 31, 2002

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**SAFETY AUDIT TEAM MEMBERS:**

**Paul Nikolas, SDDOT Road Design Engineer**

**Sharon Johnson, Construction and Maintenance Engineer, FHWA**

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**Rob Burton, City Commissioner and Business Consultant**

**Vernon “Skip” Vanderhule, Attorney and Business Owner**

**Scott Jansen, SDDOT Region Traffic Engineer**

**AUDIT DATE:**

**January 8 and 9, 2002**

**PROJECT DESCRIPTION:**

**US Highway 81 (Tom Brokaw Boulevard or Broadway) is a 4 lane divided with medians from West 8<sup>th</sup> Street to the south and a 5-lane section from West 8<sup>th</sup> Street north to 23<sup>rd</sup> Street. Shoulders exist from the West intersection of 2<sup>nd</sup> Street north to 23<sup>rd</sup> Street. The existing speed limit is 30 miles per hour. ADT is 9605 with projected ADT of 12929 in 2019. Major intersecting streets include SD 50/SD 52 (4<sup>th</sup> Street), West 8<sup>th</sup>, East 8<sup>th</sup>, 15<sup>th</sup> Street, 21<sup>st</sup> Street and 23<sup>rd</sup> Street.**

**US Highway 81 will be reconstructed from 2<sup>nd</sup> Street Sta. 108+59 to 23<sup>rd</sup> Street Sta. 98+00 in Yankton.**

**INFORMATION/MATERIALS USED DURING THE AUDIT:**

**Preliminary project plans,  
Record of public hearing,  
Traffic accident data,  
Parking study data,  
Traffic volume data,  
AASHTO Road Design Manual,  
Federal Manual on Uniform Traffic Control Devices,  
State of South Dakota Standard Specifications,  
Highway Capacity Manual**

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## **SAFETY CONCERNS/FINDINGS:**

1. Existing HyVee access between 21<sup>st</sup> Street and 23<sup>rd</sup> Street - 40' access with three lanes marked as one lane inbound, one left turn lane exiting and one right turn lane exiting. US 81 traffic must slow in order to turn into the access increasing the potential for rear end accidents. Make exclusive right turn lane for HyVee approach or larger radius on the access. Hy Vee should consider striping as two lane approach, one lane enter and one lane exit.

Same concern may exist at Kmart access approach. Consider need for corrective action at this location also.

2. East 8<sup>th</sup> Street and US 81 intersection –

Raised median shown in the project plans from south of East 8<sup>th</sup> Street extending north past 10<sup>th</sup> Street.

The median will:

- Eliminate the potential for conflict between westbound right turning 8<sup>th</sup> Street traffic and westbound left turning 10<sup>th</sup> Street traffic.
- Aligns the US 81 southbound left turning traffic to eliminate wide sweeping left turns onto 8<sup>th</sup> Street.
- Minimize conflict points.

The median will not:

Permit left turn from 10<sup>th</sup>. Right in right out only.

Work for Vanderhule storage large truck traffic. Vanderhule would have to use local residential streets for large truck traffic to get access in and out of the business. The median will require the rebuild of the intersection of 8<sup>th</sup> and Cedar to permit truck turning.

Permit southbound left turns onto East 10<sup>th</sup> when trains use the RR crossing.

Allow northbound left turning traffic to access the businesses on the west side of US 81.

Allow southbound left turns onto 10<sup>th</sup>. Encourages traffic to turn left across tracks.

Provide adequate southbound left turn storage for traffic turning left at 8<sup>th</sup> Street. Vehicles will stack to the north across the tracks and hinder southbound traffic movement.

Allow left turning traffic from 8<sup>th</sup> to use the center two-way turn lane to merge into southbound US 81 traffic during peak traffic hours.

Options discussed:

- A. Do not construct the raised median. Rebuild East 8<sup>th</sup> Street to be at a right angle with US 81 as shown in the plans.
- B. Study intersection for traffic signal. Consider detector loop on 10<sup>th</sup> to allow left turning 10<sup>th</sup> Street to access US 81 while allowing right turn from 8<sup>th</sup> with protected movement.
- C. Realign East 8<sup>th</sup> more to the south to provide greater separation between 8<sup>th</sup> and 10<sup>th</sup>. Would need to purchase building/property.
- D. Consider a project to construct a new alignment of East 8<sup>th</sup> Street from Douglas Street westerly to connect with US 81 to provide the forth approach on the east side of the intersection of US 81 at West 8<sup>th</sup>. The City of Yankton should pursue initiation of a project to construct this street. Remove existing East 8<sup>th</sup> Street between Cedar and US 81. Project funding by the City with assistance from Federal or State monies available for local projects. Property between Douglas Street and US 81 appears to be attainable with low cost right of way purchases. However, owner of old school property will need to be contacted soon as development is tentatively planned for the old school property east of Cedar. This project would provide a major east/west arterial through the City of Yankton. The construction of a structure would be required over the creek.

Recommendation:

Option A should be accomplished with the project as a short term solution until the City can initiate a project to construct Option D. Option B to be pursued by the State.

- 3. Pedestrian crossings should be considered during scoping of the traffic signals.
- 4. 8' shoulder on the cross section -

It was determined that reasons to construct or not to construct the 8' shoulder were not defined during the public hearing process. The following findings were discussed:

- The 8' shoulder provides for parking of trucks. Concerns that trucks have no locations to park and access fast food businesses along US Highway 81. The parking of truck along a busy arterial street can cause traffic conflicts, restrict the flow of traffic on US

81, increases overall delay to through traffic and restrict sight distances from intersecting streets.

- It is an owner perception and concern that the removal of the 8' shoulder will decrease the value of adjacent private property.
- Eliminates need for the property owner to shovel plowed snow from a sidewalk.
- Eliminates need for property owner to maintain grass in boulevard unless a concrete boulevard is constructed.
- The 8' shoulder provides for parking of campers. Concerns that campers have no locations to park and access fast food businesses along US Highway 81. The parking of campers along a busy arterial street can cause traffic conflicts, restrict the flow of traffic on US 81, increase overall delay to through traffic and restrict sight distances from intersecting streets.
- Parked vehicles along US Highway 81 can cause restricted sight distances from side street approaches.
- The City can temporarily pile snow in the shoulder area until it can be hauled away. The storage of snow in the shoulder area is a safety concern. The shoulder should not be used for the storage of snow on a long-term basis.
- Public concerns and Roadway Safety Inspections have noted problems with motorists using the 8' shoulder area as right turn lanes at intersections. The right turning traffic in the 8' shoulder area conflicts with right turning traffic in the right hand lane of the roadway. This indicates a need to eliminate the 8' shoulder at the intersections. If the 8' shoulder area is left in place, rumble strips should be considered at the approach to intersections to deter the use of the 8' shoulder as a right turn lane.
- The elimination of the 8' shoulders would result in a \$300,000 cost reduction to the project.
- Reconstructing without the 8' shoulder would reduce the amount of right of way to be purchased to construct the project. Only 15% of the right of way currently required (excluding driveway access issues) would be necessary.
- The shoulder area is now used for very limited parking north of West 8<sup>th</sup> Street. 0-6 vehicles park along this section of US 81 at any given time. Many business owners are persons found to park within the 8' shoulder area. All businesses except for one have off street parking.
- The total of 16' of shoulder (8' per side) increases the amount of time for pedestrians to cross at signalized intersections by approximately 4 seconds (4 ft/second walk rate) unless intersection radii are increased substantially. The increased time for

pedestrians to cross will increase overall vehicular delay to the motorists using US Highway 81.

- The total of 16' of shoulder (8' per side) increases the distance that side street motorists must cross during a left turn. The extra distance has may be factor in increased potential for left turn accidents.
- If the 8' shoulder is eliminated, utilities such as water and sewer can be constructed beneath a grass boulevard area verses beneath the 8' concrete shoulder. When the utilities need to be maintained, the utility can be reached by digging through dirt and not require concrete removal and replacement.

Recommendation:

The RSA group recommends that the State and the City review the need for the 8' shoulder. It is recommended that a list of the above findings with respect to the 8' shoulders be provided to all property owners along US Highway 81. The property owners be given adequate time to review the above findings. The subject of removal of the 8' shoulders should be discussed with the property owners during the landowner meetings.

5. US 81 and 2<sup>nd</sup> (West intersection) check radius for westbound to northbound right turning traffic.
6. Discussed permanent traffic control at the intersection of US 81 and 2<sup>nd</sup> Street. Leave as is for now. SDDOT and City to consider need for traffic signals if and when the new Missouri River Bridge is constructed.
7. 15<sup>th</sup> Street intersection. Check the adequacy of the southbound sight distance for US 81 to the traffic signal.
8. Mailbox location within sidewalk. Is this being addressed on the project? Consolidate mailbox installations.
9. 4<sup>th</sup> and Broadway – increase radius on 4<sup>th</sup> for northbound trucks turning east in southeast quadrant. Recommend the purchase of the building and increase radius in southwest quadrant. It is perceived that Nebraska traffic will increase due to expressway development. Nebraska returning from Lewis and Clark will require larger radius. Increase size of radius in northwest quadrant for southbound trucks turning west.
10. 3<sup>rd</sup> and Broadway – determine if traffic signal should be retained.
11. 11<sup>th</sup> and Broadway, Texaco Station - If access removed, how will gas transport access tanks at the station. Revise parking lot?

12. US 81 at 15<sup>th</sup>. During slick road conditions, northbound vehicles have difficulty getting adequate traction to leave the approach. This may be a safety problem as indicated by accident history. Consider changing vertical slope of the roadway or consider special traction aids in concrete.
13. Provide LEDs in traffic signal heads.
14. The horizontal curve on the re-alignment of East 8<sup>th</sup> Street has a 30' radius (approx. a 200 degree curve). Can this curve be flattened? As a minimum provide proper warning signs in advance of the curve.
15. Consider street furniture placement with respect to ADA requirements, ROW, etc.
16. Consider placement of roadway light poles with respect to ADA requirements, ROW, etc.
17. Align business accesses across the street from one another where possible. Control the amount of accesses with minimal impact to businesses.
18. Make sure radii at intersections are adequate for truck turning movements. Trailer and cab lengths are increasing. Some vehicles are longer than 62'. Vehicles with length up to 75' are common.
19. Traffic signal interconnect should be accomplished.
20. Traffic sequencing during the project and the need to modify traffic signal indications if head-to-head traffic on one side of the roadway is maintained.
21. US 81 and 15<sup>th</sup> Street – Local business owner concern with sight distances with respect to the south access into the Broadway Inn. Consider combining the south access and leave the north access. City has dealt with concern w/r to traffic problems at the south access. Elimination of the south access and leaving only one access will cause problems with large vehicles entering, turning around and leaving the property. Consider an access in between the two existing accesses.
22. RR xing at 8<sup>th</sup>. Is the rebuild of the crossing included in the plans?
23. Nighttime concerns: a.) increase roadway lighting at 21<sup>st</sup> and Broadway, b.) use grooved cold applied 380 markings on roadway surface, c.) increase roadway lighting at 2<sup>nd</sup> and Broadway.
24. Water pools at the intersection of 21<sup>st</sup> and Broadway during heavy rains. Make sure storm sewer system is adequate at this location. Locals note that velocity of water flowing towards US 81 is high enough that causes the water to jump over the drop inlet. Oversize inlets?

25. Temporary signs within ROW blocking view or restricting sight distances must be removed.
26. Ambulance service uses the intersection of 8<sup>th</sup> and Broadway. Consider traffic signal preemption for emergencies on all signals.
27. Bike traffic accommodation. Work with the locals to provide and accommodate bike traffic.
28. Snow and ice against retaining wall at Robinson Erhart at 21<sup>st</sup> and Broadway causes pedestrians to walk in street. Can a boulevard be installed between sidewalk and curb to allow storage of snow?
29. The radius for northbound traffic from south Broadway that is turning east onto 2<sup>nd</sup> Street should be enlarged for large truck traffic.
30. Consider curb, sidewalk or boulevard area designs that will reduce the potential for parked motorist to encroach into ROW.
31. Add truck route marker signing at the intersection just north of the current Meridian Bridge indicating truck traffic for East State Highway 50 should turn right after crossing the Meridian Bridge. This to be accomplished in the permanent signing of the project plans.